

# APPLICATION FOR LETTERS PATENT OF THE UNITED STATES

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0990441-11601

## SPECIFICATION

To all whom it may concern:

Be It Known, That I, SYLVIE FEGHALI HADDAD, of Columbia, SC, have invented certain new and useful improvements in SYSTEM AND METHOD FOR IMPLEMENTING PRIVACY PREFERENCES AND RULES WITHIN AN E-BUSINESS DATA WAREHOUSE, of which I declare the following to be a full, clear and exact description:

**SYSTEM AND METHOD FOR IMPLEMENTING PRIVACY  
PREFERENCES AND RULES WITHIN AN  
E-BUSINESS DATA WAREHOUSE**

**5 CROSS REFERENCE TO RELATED APPLICATIONS**

This application is related to the following co-pending and commonly-assigned patent applications, which are incorporated by reference herein:

*AS*  
*9/24/4*  
10 Application Serial No. 09/990539, entitled "SYSTEM AND METHOD FOR CAPTURING AND STORING INFORMATION CONCERNING WEB VISITOR BROWSING ACTIVITIES IN A DATA WAREHOUSE"; filed on 11/16/01 by Scott D. Carty, Sylvie F. Haddad and Tucker Smith; NCR Docket Number 9624.

*AS*  
*9/24/4*  
15 Application Serial No. 09/992571, entitled "SYSTEM AND METHOD FOR CAPTURING AND STORING INFORMATION CONCERNING OPERATIONAL METRICS OF A BUSINESS WEB SERVER AND WEB SITE"; filed on 11/16/01 by Scott D. Carty, Sylvie F. Haddad, and Tucker Smith; NCR Docket Number 9626.

*AS*  
*9/24/4*  
20 Application Serial No. 09/990541, entitled "SYSTEM AND METHOD FOR CAPTURING AND STORING WEB SITE VISITOR PROFILE INFORMATION IN A DATA WAREHOUSE"; filed on 11/16/01 by Scott D. Carty, Sylvie F. Haddad, and Tucker Smith; NCR Docket Number 9627.

*AS*  
*9/24/4*  
25 Application Serial No. 09/990634, entitled "SYSTEM AND METHOD FOR CAPTURING AND STORING INFORMATION CONCERNING ON-LINE ADVERTISING CAMPAIGNS, PROMOTIONS, AND ADVERTISEMENTS OF AN E-BUSINESS

RETAILER"; filed on 11/16/01 by Scott D. Carty and Tucker Smith; NCR Docket Number 9628.

Application Serial No. 09/996 902, entitled "SYSTEM AND METHOD FOR CAPTURING AND STORING OPERATIONAL DATA CONCERNING AN INTERNET SERVICE PROVIDER'S (ISP) OPERATIONAL ENVIRONMENT AND CUSTOMER WEB BROWSING HABITS"; filed on 11/16/01 by Scott D. Carty and Tucker Smith; NCR Docket Number 9629.

## FIELD OF THE INVENTION

The present invention relates generally to a Customer Relationship Management System for an E-Business retailer, and more particularly, to a system and method in which the collection and use of customer information is governed by specific privacy consent information obtained from customers of the E-Business retailer. Still more particularly, the present invention is related to a logical data model that defines the structure for storing and organizing privacy policy and privacy consent information within an E-Business customer relationship management system.

## BACKGROUND OF THE INVENTION

As the World Wide Web evolves into an increasingly dynamic channel for marketing and commerce, web sites are becoming mission-critical components of overall business strategies. Sophisticated businesses no longer view the web as a venue of relatively anonymous transactions, but as a crucial point of contact between the business and its customers - a place where lasting customer relationships can be forged and maintained. Businesses realize that, at each point of customer contact, significant

amounts of data are being gathered and stored. The data from these disparate systems needs to be sorted, merged and coalesced into meaningful business information.

Companies for whom the Internet is a primary, if not the primary, conduit for managing customer relationships have invested heavily in their online businesses. To measure the return on this investment, and make the most of the web-marketing channel, managers need an E-Business Data Warehouse solution that can provide answers to the following types of questions:

- Who are our best prospects and why?
- Where are our most profitable customers coming from....which of our partner refers them to our site?
- Which of our banner ad campaigns is driving the most qualified traffic to our site?
- Which banner ad is generating the most revenue?
- Which banner ad has the best buy versus browse ratio?
- Which products are selling best online and why?
- How many new or repeat visitors come to our site in a given time period?
- What is the percentage and total number of new customers, existing customers, browsers for a given time period?
- What is the conversion ratio for all customers coming to the site, by referral, by customer segment?
- What is the average number of browse sessions prior to first purchase, second purchase, ...nth purchase, by customer segment over a given time frame?

Whereas the success of a company's web site was once measured in hits and page views, with the web master as primary audience for reports based on those metrics, the performance and information obtained from the web site is now critical to many members of the organization. To answer  
5 questions like the samples above, an E-Business Data Warehouse solution must be able to correlate click stream data with data from other disparate sources and transform it into actionable information available to users throughout the Enterprise.

While understanding online customers is necessary for an E-Business  
10 company's success, and extracting business information from web site traffic is imperative, web site complexity is growing exponentially.

Today's complex web sites often employ geographically distributed servers and a mix of solutions, e.g., Ad Servers, Application Servers, Profile Servers, Content Management Systems and various Personalization  
15 technologies, to offer visitors a richer, more dynamic personal experience in the hope of turning those visitors into loyal customers. In addition, more and more companies are moving traditional business applications to the web and linking back-office systems to their online environments.

These complex information architectures linking intranets, extranets and  
20 the Internet create vast amounts of raw data. The resulting site complexity, disparate data sources, and data volumes makes accurate and complete customer analysis difficult to impossible for most vendor solutions.

NCR Corporation has developed an E-Business Data Warehouse solution to provide the answers, embedded in this complex E-Business  
25 environment, to questions about online customers. NCR Corporation's E-Business Data warehouse solution, referred to herein as the Teradata Solutions for E-Business (TSEB), provides the decision support engine and

surrounding technology to turn disparate customer information into knowledge. The ability to easily handle large amounts of data coupled with the ability to integrate data from many sources allows NCR Corporation to provide the most robust and scalable complete E-Business Data Warehouse Solution available in the industry.

Within any system including a depository of customer-related information, protection of personal privacy and customer privacy preferences is an important concern. Currently, there is no uniform set of laws, regulations, or conventions for E-Businesses to apply toward this problem. On the contrary, there are very different laws, conventions, and standards in play throughout the world - particularly between the United States and Europe. Following is a very brief summary of the latest versions of such regulations.

P3P or Platform for Privacy Preference was developed by the World-Wide Web Consortium (W3C). It is the emerging US standard. It provides a standard XML based schema for defining a Web Site Privacy policy, a personal profile and personal privacy rules as well as a protocol to be used by privacy agent software to negotiate between a site and a consumer. P3P defines 15 basic privacy categories. Consumer consent can be given at the category level or at a more granular element level.

The Children Online Privacy Protection Act (COPPA) was developed by the Federal Trade Commission (FTC). It went into law on October 21, 1998. It requires certain commercial sites to get explicit verifiable parental consent before collecting, using or disclosing personal information from children under 13. The sites must also prominently display their privacy policy which states what data is being collected and how it will be used.

The European Directive 95/46/EC, supplemented in 97/66/EC provides European consumers with rights relative to notice, explanation of the logic behind automatic processing, correction/deletion/blocking and the right to object. It also imposes responsibilities on the data administrators to only keep the data as long as necessary, prevent unauthorized access, insure data accuracy etc. In the case of sensitive data such as racial/ethnic, political, religious, philosophical, etc. the EU directive requires an explicit opt-in. Additionally it offers the consumers the right to opt-out of Automated Decisions.

The standards distinguish between different types of consent: Direct Marketing, 3<sup>rd</sup> party disclosure, and Affiliate disclosure. The EU adds Sensitive Data consent (explicit opt-in) and Automated decision code.

On July 27, 2000 the Network Advertising Initiative (NAI) with the support of the FTC announced an agreement that requires explicit opt-in for the merger of Personally Identifiable Information (PII) with previously collected non-PII. They also agreed not to use PII about sensitive data (medical, financial etc). This agreement has implication on the Data Warehouse privacy design as well.

The above standards do not guarantee that the E-Commerce companies are actually executing on their policies as stated. The Online Privacy Alliance, of which NCR is a founding member, encourages the use of independent privacy auditors who assess the business' conformance to its published privacy policy. These companies, such as TRUSTe and BBB Online, award a business a "Seal of Compliance" when their privacy practices are in conformance. Auditing requires tracking of historical consent code updates.

What is needed is an extensible solution that can encompass known laws and standards and dynamically control access to personal information that may be used by analytical applications, e.g., reports, statistical models, etc. For example, the solution should limit access to personal information on minors for an application executing in the United States, but would need to enable access to that information to that same application executing in a European county.

### SUMMARY OF THE INVENTION

It is an object of the present invention to provide a system and method for capturing, storing and using customer information within an E-Business customer relationship management system.

It is a further object of the present invention to provide such a system and method in which the collection and use of customer information is governed by privacy consent information obtained from customers of the E-Business retailer.

It is a still further object of the present invention to provide a logical data model that defines the structure for storing and organizing privacy policy and privacy consent information within an E-Business customer relationship management system.

The foregoing objects are accomplished through utilization of a database system for storing and managing information obtained from and about customers and potential customers of an E-Business retailer. Data is stored within a database in accordance with an E-Business logical data model which defines the manner in which customer related information, as well as privacy policy and privacy consent information governing the collection and use of customer related information, is stored and organized



within a database. The database includes a database table containing privacy consent default values for customers of the E-Business retailer; a database table containing high-level privacy consent values selected by the customers; a database table containing privacy consent values selected by the customers for a plurality of privacy categories defined by the Platform for Privacy Preference (P3P); and a database table containing privacy consent values selected by the customers for different customer addresses. In the situation where customers or potential customer include minor children, the database may further include a database table containing parental privacy consent values for said children under thirteen years of age.

In the preferred embodiment, the database system also includes database tables containing histories of changes to the tables containing privacy consent default values, high-level privacy consent values, the specific privacy consent values related to Platform for Privacy Preference (P3P), the privacy consent values related to a customer's different addresses, and the parental privacy consent values for said children under thirteen years of age. Customer privacy consent and consent history information is organized within the database tables in accordance with a PRIVACY subject area within the E-Business logical data model.

Still other objects and advantages of the present invention will become readily apparent to those skilled in the art from the following detailed description, wherein the preferred embodiments of the invention are shown and described, simply by way of illustration of the best mode contemplated of carrying out the invention. As will be realized, the invention is capable of other and different embodiments, and its several details are capable of modifications in various obvious respects, all without

departing from the invention. Accordingly, the drawings and description thereof are to be regarded as illustrative in nature, and not as restrictive.

## BRIEF DESCRIPTION OF THE DRAWINGS

5           The present invention is illustrated by way of example, and not by limitation, in the Figures of the accompanying drawings, wherein elements having the same reference numeral designations represent like elements throughout and wherein:

10           Figure 1 is a block diagram illustration of an operational architecture of the Teradata Solutions for E-Business in accordance with the present invention.

            Figure 2 is a high level illustration of a system architecture of the Teradata Solutions for E-Business in accordance with the present invention.

15           Figure 3 is a subject area model of an E-Business industry logical data model, illustrating the subject areas included within the LDM, in accordance with the preferred embodiment of the present invention;

20           Figures 4A and 4B illustrate an entity-relationship diagram of the AD subject area of the logical data model in accordance with the preferred embodiment of the present invention;

            Figures 5A and 5B illustrate an entity-relationship diagram of the CALANDER DATE subject area of the logical data model in accordance with the preferred embodiment of the present invention;

25           Figure 6A and 6B illustrate an entity-relationship diagram of the CONTACT INFORMATION subject area of the logical data model in accordance with the preferred embodiment of the present invention;

Figures 7A through 7E illustrate an entity-relationship diagram of the INTERNET SERVICE PROVIDER (ISP) subject area of the logical data model in accordance with the preferred embodiment of the present invention;

5        Figures 8A through 8E illustrate an entity-relationship diagram of the ITEM subject area of the logical data model in accordance with the preferred embodiment of the present invention;

Figure 9A and 9B illustrate an entity-relationship diagram of the LOCATION subject area of the logical data model in accordance with the preferred embodiment of the present invention;

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Figure 10 is an entity-relationship diagram of the MULTIMEDIA COMPONENT subject area of the logical data model in accordance with the preferred embodiment of the present invention;

Figures 11A through 11F illustrate an entity-relationship diagram of the PRIVACY subject area of the logical data model in accordance with the preferred embodiment of the present invention;

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Figures 12A through 12G illustrate an entity-relationship diagram of the PROFILE subject area of the logical data model in accordance with the preferred embodiment of the present invention;

Figures 13A and 13B illustrate an entity-relationship diagram of the PROMOTION subject area of the logical data model in accordance with the preferred embodiment of the present invention;

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Figure 14 is an entity-relationship diagram of the TIME subject area of the logical data model in accordance with the preferred embodiment of the present invention;

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Figures 15A thorough 15E illustrate an entity-relationship diagram of the TRANSACTION ACTIVITY subject area of the logical data model in accordance with the preferred embodiment of the present invention;

Figures 16A and 16B illustrate an entity-relationship diagram of the  
5 VENDOR subject area of the logical data model in accordance with the preferred embodiment of the present invention;

Figures 17A through 17F illustrate an entity-relationship diagram of the VISIT subject area of the logical data model in accordance with the preferred embodiment of the present invention;

10 Figures 18A through 18E illustrate an entity-relationship diagram of the VISITOR subject area of the logical data model in accordance with the preferred embodiment of the present invention;

Figure 19 is an entity-relationship diagram of the WEB SERVER  
15 subject area of the logical data model in accordance with the preferred embodiment of the present invention;

Figures 20A and 20B illustrate an entity-relationship diagram of the WEB VISIT subject area of the logical data model in accordance with the preferred embodiment of the present invention;

## 20 **BEST MODE FOR CARRYING OUT THE INVENTION**

Figure 1 illustrates the operational architecture of the Teradata Solutions for E-Business. Components of the architecture shown include external operational databases 107, web logs 111 and extraction, translation and loading (ETL) tools 109 and 113 for extracting data from the data  
25 sources 107 and 111, respectively, and preprocessing the extracted data for entry into the data warehouse. The data warehouse 101 includes staging tables 115, ETL tools 117, an E-Business database 103 organized in

accordance with an E-Business LDM 105, E-Advertiser and E-Business  
Dimensional Data Models 119 that support the creation of reports, and an  
E-Advertiser and E-Business Metadata Database 127 providing report  
definitions (templates, filters, etc.) and dimensional model-to-data  
5 warehouse mapping.

In the operational architecture shown in Figure 1, Dimensional Data  
Models 119 and Metadata Database 127 are components of MicroStrategy  
Incorporated Decision Support System (DSS) software toolset. These two  
components work together with external MicroStrategy DSS server  
10 components 121 and MicroStrategy applications 123 and 125 to create and  
modify E-Business and web site reports.

Operational data 107 and web logs 111 are loaded into the staging  
tables on a regular basis, using extraction, transformation, and loading  
(ETL) tools 109 and 113, respectively. The data is then transferred from  
15 the staging tables 115 to the TSEB LDM physical database 103 using ETL  
tools 117. The MicroStrategy DSS tools, used to analyze the data in the  
TSEB, require a star schema database to create multidimensional reports.  
To create this schema, a dimensional LDM 119 is defined using views and  
tables in the TSEB physical database.

20 The operational data, i.e. filters, templates and reports, for  
MicroStrategy is contained in the metadata database 127. This database is  
created using a MicroStrategy SQL Script, and populated with project  
information via MicroStrategy Architect 125 and Agent 123. When one of  
the MicroStrategy applications performs a function that accesses the  
25 dimensional LDM, the appropriate information is extracted from the  
metadata database.

Figure 2 illustrates a system architecture for the Teradata Solutions for E-Business. The main components of the TSEB solution are:

- Teradata warehouse running on an NCR UNIX SVR4 MP-RAS or a Windows NT server 201; and
- Analysis and data mining applications running on a separate Windows NT server 207.

The TSEB configuration should be implemented as a two-tier (minimum) or three-tier (preferable for databases more than 3 GB) architecture. The Teradata data warehouse 101, for security and performance, should run on a remote server 201 and the other components run on separate servers. Other components may include an NT or UNIX server 203 for housing operational database 107, a web server 205 for housing web logs 111, and an NT server 207 and NT or Windows client workstation 209 supporting MicroStrategy server components 121 and applications 123 and 125.

The source of the data that will be stored in the data warehouse depends upon the type of business for which the warehouse is being implemented. At a retail site, customer data will come from the business' operational database, web interaction data will come from the business's web logs, and transactional and product data will come from the business' commerce database. For an ISP support business (such as an E-Advertiser), customer data will come from registration and purchase information. Web data will come from web logs gathered from many sites, and transactional data will come from many businesses.

### Logical Data Model Design Basics

A logical data model (LDM) is an abstract construct that is physically realized in the database or data warehouse. The data model provides an architecture for the information that will be included in a data warehouse. The database provides the physical realization of that architecture in a form that can be efficiently maintained and used. There may well be some differences between the logical data model and the final database design. The database may include some tables (summary tables, etc.) or columns that have no direct correlation in the logical data model. Elements in the logical model may be grouped differently in the physical database.

A logical data model is organized by Subject Areas, each comprised of numerous Entities, Attributes and Relationships. The data model hierarchy includes one or more Subject Areas. Each Subject Area includes one or more Entities or Tables, each having Attributes and Relationships. Each Attribute describes a fact about an Entity. Relationships between two or more Entities are further defined by Cardinality. The Relationships define which entities are connected to other entities and the cardinality of the relationships. Each of these elements will be described in greater detail below.

### Subject Area

A subject area is a subset of objects taken from the universe of data objects for a particular line of business or industry that focus on a particular Business Process. Typically, a subject area is created to help manage large data architectures that may encompass multiple business processes or business subjects. This is the highest-level data concept

within a conceptual entity/relationship (E/R) model. Working with subject areas is especially useful when designing and maintaining a large or complex data model. Dividing the enterprise into several distinct subject areas allows different groups within an organization to concentrate on the processes and functions pertinent to their business area.

### Entity

An Entity represents a person, place, thing, concept, or event (e.g. PARTY, ACCOUNT, INVOICE, etc.). It represent something for which the business has the means and the will to collect and store data. An Entity must have distinguishable occurrences, e.g., one must be able to uniquely identify each occurrence of an entity with a primary key (e.g. Party Identifier, Account Identifier, Invoice Number, etc.). An Entity is typically named with a unique singular noun or noun phrase (e.g., PARTY, BILLING STATEMENT, etc.) that describes one occurrence of the Entity and cannot be used for any other Entity. It should be exclusive of every other Entity in the database. An Entity cannot appear more than once in the conceptual entity/relationship (E/R) model. Each Entity may have relationships to other Entities residing in its own Subject Area or in other Subject Areas.

### Attribute

An Attribute is a data fact about an Entity or Relationship. It is a logical (not physical) construct. It is data in its atomic form. In other words, it is the lowest level of information that still has business meaning without further decomposition. An example would be FIRST NAME, or LAST NAME. An example of an invalid attribute would be PERSON



NAME if it includes both the first and last names, as this could be further decomposed into the separate, definable (first name, last name) data facts.

### Relationship

5 A Relationship is an association that links occurrences of one or more Entities. A Relationship must connect at least one Entity. If only one Entity is connected, the Relationship is said to be Recursive. A Relationship is described by a noun or passive verb or verb phase that describes the action taken in the Relationship. A Relationship represent a static state of being between the occurrences of the Entities it connects. Relationships are not intended to represent processes or data flows. They cannot be linked to another Relationships. They may optionally represent future, present, and/or past relatedness. The time frame must be explicitly defined in the data definition. Relationships may contain attributes. In a normalized model, a Relationship containing Attributes will result in the creation of an Entity.

### Cardinality

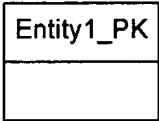
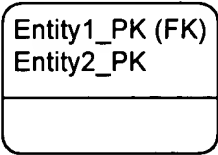
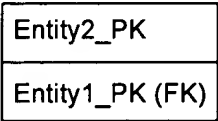
In order for a data model to be considered accurate, it must contain both the maximum and minimum number of Entity occurrences expected. This is controlled by rules of cardinality, which describes a relationship between two Entities based on how many occurrences of one Entity type may exist relative to the occurrence of the other Entity. Typically, it is a ratio, commonly depicted as a one-to-one (1: 1); one-to-many (1:N); and many-to-many (M:N) relationship.

The maximum cardinality may be an infinite number or a fixed number but never zero. The minimum cardinality may be zero, or some

other positive number, but it must be less than or equal to the maximum cardinality for the same relationship.

The logical data model for the E-Business will now be described in more detail. The logical data model uses IDEF1X modeling conventions,  
5 as shown in Table 1.

Table 1. Entity Conventions

Convention	Definition
<p>ENTITY1</p> 	<p>Independent entity. An entity is depicted as a box, with its name above the box in singular, uppercase form. Square-boxed entities are independent. They rely on no other entity for their identification. Primary keys are attributes that uniquely identify the entity. Primary keys are shown at the top of the box, separated from other listed attributes by a horizontal line.</p>
<p>ENTITY2</p> 	<p>Dependent entity. Round-cornered entities are dependent on one or more entities for their identification. (FK) following the primary key attribute indicates a foreign key - an attribute in the entity that is the primary key in another, closely related entity.</p>
<p>ENTITY2</p> 	<p>An independent entity may also include a foreign key as a "non-primary key foreign key". A non-primary key foreign key is shown below the horizontal line separating primary key attributes from other entity attributes.</p>

Relationship and cardinality conventions are shown in Table 2.

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Table 2. Relationship/Cardinality Conventions

Convention	Definition
	A single line at the end of a relationship link means that a single record entity B is related to only one record in entity A..
	A circle indicates that the presence of a linked record in entity A is optional.
	A double line indicates that the presence of a linked record in entity A is mandatory.
	One-to-one relationship.
	One-to-many relationship. The crow's foot symbol means that more than one instance of an entity is associated with another entity.
	One-to-one-or-more relationship. A crossbar with a crow's foot symbol means there is at least one instance of an entity associated with the other entity.
	One-to-zero-one-or-more relationship. A circle with a crow's feet symbol means there may be zero, one, or many instances of the entity associated with the other entity.
	A dotted relationship line indicates that the identity of entity B is not linked to entity A.

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### E-Business Logical Data Model

The E-Business Logical Data Model is a large data model composed of a large number of tables. To effectively view and understand the data model, the data tables have been logically organized into smaller groups called subject areas. Each subject area is comprised of a set of tables that contain information relevant to a particular entity. In addition, the subject areas address particular business questions.

Figure 3 is a subject area model of the E-Business logical data model, illustrating the subject areas included within the LDM. The Subject Area Model is a one-page overview that defines, at a high level, the scope and data requirements of the solution. Each subject area within the logical data model will be illustrated in the Figures and described in greater detail below.

The subject area model shown in Figure 3 illustrates some of the major relationships between subject areas. The boxes represent the subject areas. Each line represents a relationship between subject areas. The solid circle at the end of a relationship line represents the target of a 'many' relationship. An open circle at the end of a relationship line indicates that the relationship is optional.

The E-Business LDM is organized into seventeen major subject areas titled: AD, CALENDAR DATE, CONTACT INFORMATION, ISP, ITEM, LOCATION, MULTIMEDIA COMPONENT, PRIVACY, PROFILE, PROMOTION, TIME, TRANSACTION ACTIVITY, VENDOR, VISIT, VISITOR, WEB SERVER, WEB SITE. All but the CALANDER DATE and TIME subject areas, with relationships to all of the remaining subject

A brief description of each subject area follows:

**CALENDAR DATE** (not shown) - Information is tracked by date  
 season. Holidays are tracked by country.

**ISP (307) - The ISP component view covers all aspects of Internet Service Provider activity.**

**LOCATION (311)** - Information is stored on all physical and virtual owned or leased by the retailer to support the sale of goods, distribution, and storage. Would include kiosks, warehouses, offices, as well as internet sites.

**MULTIMEDIA COMPONENT (313)** - Stores multimedia elements that can be use to construct a web page, such as ads, catalogues, etc.

**PRIVACY (315)** - Stores information about privacy permissions from individuals, households and organizations of interest to the enterprise.

**PROFILE (317)** - Stores information concerning customer segments of interest to the enterprise. This information is typically purchased from a third party.

**PROMOTION (319)** - Contains information concerning promotions, which are defined as marketing efforts, which are different from normal practice and designed for a specific purpose. Information is stored on the various components of the promotion, including the items and ads included, the type of ad, and the market segments targeted.

**TIME (not shown)** - Records the time in a given day by hours, minutes and seconds.

**TRANSACTION ACTIVITY (323)** - Stores information concerning a customer's interaction with the company involving the sale or return of an item and the price and discounts associated with that item. It maps customers to entries in the Address Area, the item(s) of interest, and the associate dealing with the customer.

**VENDOR (325)** - Stores information about parties from which the company purchases goods and services. This would include information concerning purchase orders, returns, and items shipped directly to the company or drop shipped to a customer.

**VISIT (327)** - Stores information concerning a customer's history at a virtual store's web site. Included would be information about the ads that triggered the visit, the web pages browsed, and the items of interest to the consumer.

**VISITOR (329)** - Captures information about the users involved in web transactions and/or interactions. This area maintains information about customer's payment accounts, and household and organizational affiliations, and it maps customers to entries in the Profile Subject Area.

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**WEB SERVER (331)** - Provides summary information, operational metrics and errors about the physical server devices servicing a given web visit by a customer.

**WEB SITE (333)** - Stores information about the company's web sites  
5 including page components, page generation, and web page type.

The E-Business Logical Data Model is intended to be generic so that a wide range of business situations is encompassed. In general, the model reflects major business objects in a retail electronic store, such as products,  
10 people, service requests, and market baskets. There are also a variety of subject areas relating to customer sessions that involve browsing, purchasing, or interacting with employees. All subject area information need not be present for the model to be useful. For many types of businesses, all of the subject areas in the model will not apply.

15 The tables in a subject area represent the logical subset of tables in the data model that provide all the information for the subject area. Note how that a specific table may appear in multiple subject areas. For example, the CONTACT INFO table appears in the CONTACT INFORMATION and PRIVACY subject areas. This means that the  
20 information in the CONTACT INFO table is relevant to each of those subject areas; each subject area refers to the same physical item table.

Each Subject area and its Entities will now be described in detail.

## AD

25 The AD Subject Area, shown in the diagram of Figure 4A and 4B, is used to determine the effectiveness of ad campaigns by collecting information on the cost of ads by type, and comparing this information

with the number of times an exposure to the ad delivered a customer to a particular item or site.

The entities of the AD Subject Area are defined as follows:

AD (403) A marketing message aimed at a segment of consumers.

5 Usually mentions specific ITEMS. Can be placed in magazines, on web pages, television, etc.

AD CONTENT (405) This entity represents the subject matter contained in an AD.

10 AD IMPLEMENTATION (406) An instantiation of the marketing message represented by the parent AD entity.

AD IMPLEMENTATION TYPE (407) This entity represents the type of the AD IMPLEMENTATION. Types include WEB AD, BANNER AD, EMAIL AD, HTML TEXT AD, PRINT AD, TV AD.

15 AD IMPLEMENTATION X ITEM (408) This table associates items with an ad implementation.

AD IMPLEMENTATION X WEB VISIT (409) This entity represents the relationship between an AD IMPLEMENTATION and a WEB VISIT providing the information for determining which AD initiated the WEB VISIT. This represents the Referral to the site.

20 AD PLACEMENT (410) The entity represents a particular instance of an AD IMPLEMENTATION when an ad is actually displayed to a consumer on a web page.

AD PLACEMENT CONTRACT (411) The entity represents the agreement made between the ad service provider and the advertiser that  
25 states the time period for the contract, the number of impressions and click-throughs guaranteed to the advertisers and the cost for each impression and click-through.



AD PROVIDER (412) This entity represents the business that works with the advertisers and publishers to actually get the advertisements and place them on the publishing web sites. This entity represents the company that provides the service for placing Ads.

5 AD PROVIDER CONTACT INFO (413) Contains information regarding the address of an Ad Provider.

AD PROVIDER TYPE (414) Information regarding the type of Ad provider.

10 AD RESPONSE (415) This entity represents an action taken in response to an AD PLACEMENT.

AD RESPONSE TYPE (416) This entity represents the type of an AD RESPONSE which can be either IMPRESSION, CLICKTHROUGH, or CONVERSION.

15 AD SIZE (417) This entity represents the size of a BANNER AD by the number of pixels. Examples of AD SIZES include Full Banner (468x60) and Vertical Banner (120x240).

CONTRACT LOCATION (455) The stores/Web Sites that are covered by this contract.

20 DELETE STATUS (473) Customer Domain: Indicates if row is deleted or active.

ONLINE STATUS (571) Customer Domain: Whether the ad is online or offline

### CALENDAR DATE

25 Figures 5A and 5B illustrate an entity-relationship diagram of the CALANDER DATE subject area of the E-Business logical data model.

The CALENDAR DATE Subject Area contains information tracked by date and season. Holidays are tracked by country.

The entities of the CALANDER DATE Subject Area are defined as follows:

5 CALENDAR DATE (424) Allows for the grouping of Gregorian dates by any period defined by the enterprise. The attributes shown here represent possible rollup periods.

CALENDAR DATE X HOLIDAY (425) This entity serves as a relationship table between CALENDAR DATE and HOLIDAY to represent  
10 the many-to-many relationship.

CALENDAR DATE X SPECIAL EVENT (426) This entity represents the relationship table between CALENDAR DATE and SPECIAL EVENT to represent the many-to-many relationship.

DAY OF WEEK (472) This entity represents the names of the days  
15 in a week (Sunday, Monday...).

HOLIDAY (496) A declared non-working day. Differs by Country. Examples include Christmas, New Years Day, Bastille Day, Independence Day, etc.

LAST YEAR DATE (547) Provides a specific reference to a previous  
20 years date to the current date.

MONTH TO DATE (559) Provides a specific reference for a month to the current date.

MONTHS (560) This entity represents the months of the year. The id column uniquely identifies a month by including the number of the  
25 month in the year (1 - 12) and the year it belongs in. Example: 011999. The description column is the actual name of the month.

QUARTERS (620) This entity represents the quarters of a year. A QUARTER is uniquely identified by a quarter number (1 - 4) and the year. Example: 041999.

SEASON (635) A contiguous period of time of interest to the enterprise. Can be climate and/or marketing based. Examples include Summer, 'Christmas season', etc.

SPECIAL EVENT (644) This entity represents a day or group of days that a certain notable event occurred on. Examples include Super Bowl Sunday and Hurricane Hugo.

WEEKS (700) This entity represents the weeks of a year. The unique identifier for a WEEK consists of the week number (1 - 52) combined with the year in which the week occurs. Example: 521999.

YEAR TO DATE (701) Provides a reference of a specific date to the current date.

YEARS (702) The entity represents a calendar year.

### CONTACT INFORMATION

The CONTACT INFORMATION Subject Area, illustrated in the entity-relationship diagram of Figure 6A and 6B, stores contact information for customers & organizations, including mailing addresses, email addresses, and telephone numbers.

The entities of the CONTACT INFORMATION Subject Area are defined as follows:

CENSUS BLOCK (429) A grouping of ADDRESSes used by the government for census statistics. Usually a subset of POSTAL CODE. The number of three family household in a small geographical area, according to 1998 census data.

CITY (435) A geographical region within a TERRITORY. Can also be a hamlet, village, township, etc. Examples include: Los Angeles, Dijon, etc.

CONTACT INFO (448) A way to communicate with, or contact, PARTYs. It can be MAIL ADDRESS (P.O. Box, or street), ELECTRONIC ADDRESS, or TELEPHONE number.

CONTACT INFO STATUS (449) Indicates whether the address is still valid or not.

CONTACT INFO TYPE (450) Indicates if an ADDRESS is MAIL, ELECTRONIC, or TELEPHONE.

CONTACT INFO USAGE (451) Specifies the usage of an address.

COUNTRY (461) A geographical-political region with sovereign governing.

COUNTRY TYPE (462) Contains information about country types.

COUNTY (463) A geographic region within a TERRITORY. Example: Los Angeles County.

ELECTRONIC ADDRESS (481) A non-physical/virtual ADDRESS. Could be an e-mail, ftp, URL, etc.

LOCATION CONTACT INFO (550) Describes how a specific combination of ADDRESS and LOCATION is used. For example, '123 Main Street' is used by 'Distribution Center 23' as 'Ship To'; '310-555-2342' is used by 'Call Center 46' as 'Customer Service Fax number'.

MAIL ADDRESS (556) An ADDRESS where ITEMS can physically be delivered to. For example: 123 Main Street, P.O.Box 2001, etc.

MSA (561) Metropolitan Statistical Area. Predefined geographic areas for marketing use, center around large metropolitan areas. Such as: Miami MSA, San Francisco MSA, etc.

PARTY CONTACT INFO (585) Describes how a specific combination of ADDRESS and PARTY is used. For example: '123 Main Street' is used by 'Rachel' as 'Ship To'; '310-555-2342' is used by 'John' as 'Fax number'.

- 5 PARTY GEOCODE (587) Contains detail contact information for a specific party entity. This table is present to support NCR's Customer Relationship Management (CRM) application.

POSTAL CODE (609) A grouping of MAIL ADDRESSes assigned by the Post Office. Frequently used in marketing analysis and planning.

- 10 Examples include USA: 90210, Canada: G1s 1C1 U.K.: W1P 7HE

TELEPHONE (650) Telephone number. Could be voice, data, fax, pager.

TERRITORY (651) A geographic region within a COUNTRY. Can be a State, Province, etc., e.g., California, Quebec, Gauteng, etc.

- 15 USAGE TYPE (671) Customer Domain. Details whether the address is used for personal or business.

### ISP

- 20 Figures 7A through 7E illustrate an entity-relationship diagram of the INTERNET SERVICE PROVIDER (ISP) subject area of the logical data model. The ISP component view covers all aspects of Internet Service Provider activity.

The entities of the INTERNET SERVICE PROVIDER Subject Area are defined as follows:

- 25 ISP BILLING PLAN (514) ISP Billing plan information.

ISP BILLING PLAN SERVICE (515) Information concerning an ISPs billing services.

ISP BUSINESS CLIENT (516) Captures information concerning an ISP's business customers.

ISP BUSINESS TYPE (517) Provides information regarding the ISPs business interest.

5 ISP COMM FACILITY (518) Information concerning an ISP's communication facilities.

ISP COMM SERVER (519) Information regarding an ISP's communication servers.

10 ISP CUST ACCT REP (520) Information regarding the customer account reps for an ISP.

ISP CUST BILL PLAN (521) Information regarding an ISP's customer billing plans.

ISP CUST BILL REVENUE (522) Information regarding ISP's customer revenue from bills.

15 ISP CUST SVC REVENUE (523) Information regarding an ISPs customer service revenue.

ISP CUSTOMER ACCOUNT (524) This entity represents the accounts held by a customer.

ISP NETW ROUTER (525) ISP network router information.

20 ISP NETWORK FACILITY (526) Information regarding the physical facility components of an ISP's network.

ISP POP (527) ISP POP information.

ISP POP AREA (528) Information concerning an ISPs POP's areas.

25 ISP POP REGION (529) Information concerning an ISPs POPs regions.

ISP SERVICE CATEGORY (530) Category of services provided by an ISP.

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ISP SERVICE DESC (531) Contains information regarding the types of services that have been provided by an ISP.

ISP SERVICE TYPE (532) Information regarding the types of services provided by an ISP.

5 ISP SUBSCRIBER (533) This entity represents the subscribers to the ISP.

ISP SUBSCRIBER SESSION (534) Information regarding a customers session.

10 **ITEM**

Within the ITEM subject area shown in Figures 8A through 8D, information is tracked on each piece of merchandise or service provided by the E-Business company. Included within the subject area tables would be a description of each piece of merchandise or service, how the item was  
15 classified, price, cost, the number in inventory, etc.

The entities of the ITEM Subject Area are defined as follows:

BRAND (420) A unique name created by an ORGANIZATION to build customer recognition and affinity for a group of related ITEMS. Some ORGANIZATIONs own many BRANDs, while others build their  
20 Corporate name into a BRAND, e.g., Coke, Ruffles, Wonder Bra; Dreamcast, Dockers, etc.

BRAND OWNER ORG (421) The ORGANIZATION that created, owns, and controls a specific BRAND. For example: Nabisco, Victoria's Secret, Pepsi Co., etc.

25 CHARACTERISTIC (432) Describes a trait of an ITEM, such as Color, Height, Suitable Age rating, etc.

CHARACTERISTIC GROUP (433) A cluster of related ITEM CHARACTERISTICS. 'Size' could be a CHARACTERISTIC GROUP, with each of the dimensions (height, width, depth) being a separate CHARACTERISTIC.

5 CHARACTERISTIC VALUE (434) The actual value describing the specific CHARACTERISTIC of a specific ITEM. For example: Color = 'blue', Suitable Age rating = '12 years and older'.

10 CLASS (436) A subgrouping of like merchandise, usually created along the enterprises reporting hierarchy and associated with a certain grouping of ITEMS and ASSOCIATE(s) managing said ITEMS, e.g., a 'buyer'. A CLASS belongs to exactly one DEPARTMENT and is considered one of the highest levels at which purchasing and sales are planned. CLASS may be a level member of a retail organization's ITEM hierarchy. The actual naming convention for PRODUCT hierarchy may  
15 vary across organizations.

DEPARTMENT (474) Represents a broad group of merchandise appealing to a particular CUSTOMER's needs or an administrator's needs. A DEPARTMENT represents one of the highest, if not the highest, PRODUCT hierarchy levels in an organization. The actual naming  
20 convention for ITEM hierarchy may vary across organizations. A DEPARTMENT may be end use based, e.g., Women's Hosiery, or may be VENDOR based, e.g., Liz Claiborne Sportswear. The scope of a DEPARTMENT will largely depend on the size of the organization, but might typically cover twenty to thirty manageable categories.

25 DIVISION (478) Represents an administrative grouping of DEPARTMENTS. DIVISIONS exist to further cluster merchandise into groups for administrative or organizational reporting purposes. A



DIVISION often represents the highest ITEM hierarchy level in an organization. The actual naming convention for ITEM hierarchy may vary across organizations.

FRANCHISE (491) A concept with consumer recognition and value.

5 Often used in marketing and tie-in PROMOTIONS For example: Indiana Jones, Batman, Star Wars, Pokemon, etc.

INVENTORY CONTROL (512) A cross-reference of ITEMS to LOCATIONS for the purpose of managing INVENTORY. It specifies the required, re-ordering, and safety levels of stock.

10 ITEM (535) An ITEM is the lowest level for which inventory and sales records are retained within the STORE. It is analogous to a SKU (Stock Keeping Unit).

ITEM CHARACTERISTIC (536) The actual value describing the specific CHARACTERISTIC of a specific ITEM. An ITEM can have an  
15 unlimited number of ITEM CHARACTERISTICS. For example the "Entrapment" Movie DVD has the following ITEM CHARACTERISTICS: Aspect Ratio: '1:2.35,' Encoding: 'Anamorphic', Genre: 'Action', Age Rating: '12 and above', etc.

ITEM CONTENT (537) Describes the 'bill of material' of an ITEM  
20 that contains other ITEMS. For example the "Indiana Jones Deluxe Pack" contains: I.J Coloring Book, I.J. movie, and I.J. Action Figure.

ITEM COST (538) Cost information of an ITEM keyed by time and LOCATION. The key structure may vary as per enterprise requirements.

ITEM GROUP (539) A cluster of ITEMS grouped together for  
25 analytical or merchandising reasons. Can be used for permanent, global, or ad-hoc reasons.

ITEM GROUP XREF (540) Defines which ITEMS are contained in which GROUPs. An ITEM can be in multiple ITEM GROUPs at the same time.

ITEM PRICE (541) Pricing information of an ITEM by LOCATION.

5 The key structure may vary in accordance with enterprise requirements.

LEAD TIME (548) Contains information concerning inventory replenishment for the seasons of the year.

PRODUCT (612) A PRODUCT is a physical type of ITEM (as opposed to a SERVICE). A PRODUCT can be inventoried, and shelved.

10 PRODUCT INVENTORY (613) Represents history On Hand Stock position for a specific PRODUCT, within a specific LOCATION, for a specific PERIOD.

RELATED ITEM (629) Information concerning the relationship between two items.

15 SALES PLAN (632) A detailed plan of action of how ITEMS are marketed, sold, and distributed to each STORE.

SCAN CODE (633) A barcode or similar graphic placed upon a PRODUCT and remotely scan-able (usually optically). Can be internally or externally, e.g., UPC, created. Examples include: UPC code, the scan  
20 tickets placed upon ITEMS bought in the meat, deli, and bakery departments, etc.

SERVICE (639) A non-physical type of ITEM sold to a customer. Examples include: Installation of a new PC, Carpet cleaning, Repair service, etc.

25 STORE DEPARTMENT ITEM (646) A Cross reference of the actual ITEMS that are sold in a specific DEPARTMENT of a specific STORE. For example: 'Store 243' sells 'Fuji 100 Sensia Film' in it's 'Photo Department'.

SUBCLASS (648) A level of the ITEM hierarchy description in a retail organization. It is a member of exactly one CLASS. The actual naming convention for PRODUCT hierarchy may vary across organizations.

5 Additional entities concerning items that are articles or publications that may be included within the ITEM Subject Area are shown in Figure 8E and described below.

ARTICLE (705) A piece of writing, such as a magazine or newspaper article, provided as an ITEM for sale.

10 ARTICLE AUTHOR (706) Identifies the author of an ARTICLE.

ARTICLE COMPONENT (707) An entity that tracks MULTIMEDIA COMPONENTs associated with an ARTICLE.

ARTICLE SOURCE (708) Identifies the source of an ARTICLE, such as a news service or publisher.

15 COLLECTION (709) An entity that identifies a group of ARTICLES that are related.

COLLECTION ARTICLE (710) An identification of an ARTICLE that is a member of a COLLECTION.

RANK DESCRIPTOR (711) A ranking of ARTICLES within a  
20 COLLECTION.

## LOCATION

The LOCATION subject area provides for the storage of information concerning on all physical and virtual sites owned or leased by the retailer  
25 to support the sale of goods, distribution, and storage. Would include kiosks, warehouses, offices, as well as internet sites.

The entities of the LOCATION Subject Area, illustrated in Figures 9A and 9B, are defined as follows:

CHAIN (430) Represents all stores owned by a CORPORATION or retail organization, which perform the same business activity using the same consumer brand identity.

CHANNEL (431) The various CHANNELs in which the ITEMs are sold. ITEM prices may vary across CHANNELs., e.g., STORE (P.O.S), WEB, and CATALOG.

CORPORATION (458) The internal parent company of the enterprise's chains or subsidiaries.. A CORPORATION represents the highest level, constituting the total of all CHAINs, STOREs and DEPARTMENTS within the enterprise.

CORPORATION TYPE (459) This entity represents a classification type for a Corporation. Possible examples include Advertiser, Publisher, etc.

CORPORATION X CORPORATION TYPE (460) This entity provides for the many-to-many relationship between CORPORATION and CORPORATION type, allowing a single CORPORATION to be classified by more than one CORPORATION TYPE.

DISTRICT (477) A grouping of STORE LOCATIONs that fall within a specific geographic area. DISTRICT is used to organize groups of STOREs for the purposes of planning, reporting and analysis.

ITEM X LOCATION (542) This entity provides for the many-to-many relationship between ITEM and LOCATION.

LABOR PLAN (543) Denotes the planned labor cost and hours for a specific PERIOD, within a specific LOCATION.

LOCATION (549) A physical or virtual site which is owned or leased by the business to support its business operations.

LOCATION OPERATING COST (551) Denotes the planned and actual OPER COST HISTORY by OPER COSTs, for specific PERIOD, for  
5 a DEPARTMENT within a STORE.

LOCATION PAYMENT OPTION (552) Provides information concerning a specific locations payment options.

LOCATION TRAIT (553) A cross-reference between TRAITs and LOCATIONS, describing the specific TRAITs that belongs to a  
10 LOCATION.

LOCATION TYPE (554) Identifies the type of LOCATION, for example, STORE or DISTRIBUTION CENTER. A finer level of differentiation can also be used, for example: a Mall, Stand Alone Center, SuperStore, Clearance Warehouse, or Mini Mall.

15 OPERATING COST (572) Denotes the types of OPERATING COSTs for a LOCATION. The expenditure items can include: Rent, Service Charge, Heat and Electricity, Distribution, Repairs, Facility Maintenance and Grounds, Equipment Maintenance, Security, Cleaning, Refuse, Communication - Telephone, Mail, FedEx, Bank Charges,  
20 Stationary and Supplies, and Labor.

OPERATING COST TYPE (573) Classifies the different OPERATING COSTs into logical groupings. For example: utilities, office-related, maintenance, etc.

25 REGION (628) An intermediate organization grouping level within the geographic hierarchy, which groups LOCATIONS. A specific regional geographic area of the country or county.

STORE DEPARTMENT (645) A physical area and/or clustering of  
ITEMs within a STORE

STORE DEPARTMENT XREF (647) A cross-reference showing the  
specific DEPARTMENTS within a specific STORE.

5 TRAIT (653) A generic construct to describe characteristics of a  
LOCATION.

WEB STORE SALES (696) This is an aggregating entity. If the  
advertiser chooses not to share detailed sales information with the  
advertising service provider (or the marketing systems integrator), then this  
10 summary information is enough for the broadest cost-benefit analysis.  
Note that sales figures are not aggregated on a per-item basis. Since web  
ads refer visitors to the web store in general, not to specific items, it makes  
sense to track sales for the store as a whole. Conversely, when ads are  
bought with guaranteed exposure to specific target markets it makes sense  
15 to track store sales grouped by the same segmentation.

### MULTIMEDIA COMPONENT

Figure 10 is an entity-relationship diagram of the MULTIMEDIA  
COMPONENT subject area. The MULTIMEDIA COMPONENT subject  
20 area stores multimedia elements that can be use to construct a web page,  
such as ads, catalogues, etc.

The entities of the MULTIMEDIA COMPONENT subject area are  
defined as follows:

AD COMPONENT (404) An associative entity that tracks  
25 MULTIMEDIA COMPONENTs involved in the creation of an AD.

COMPONENT CONTENT TYPE (438) This domain identifies the  
types of multimedia components (vs web pages) source. The

COMPONENT CONTENT TYPE is prepopulated with the standard suffixes of multimedia objects.

IMAGE TYPE (501) This entity represents the type of image for a MULTIMEDIA COMPONENT that is an image, i.e., Preview or Full.

5 MULTIMEDIA COMPONENT (562) MULTIMEDIA COMPONENT refers to various multimedia elements that can be use to construct a WEB PAGE, AD, catalog, etc.

MULTIMEDIA TYPE (563) Classification scheme used to categorize MULTIMEDIA COMPONENTs. Useful in tracking components at a  
10 summary level.

PAGE COMPONENT (576) An associative entity that tracks various components appearing on a WEB PAGE.

## PRIVACY

15 The PRIVACY Subject Area stores information about privacy permissions from individuals, households and organizations of interest to the enterprise.

The entities of the PRIVACY subject area, illustrated in Figures 11A through 11F, are defined as follows:

20 CONSENT OPTION (441) This is the actual opt-in and opt-out domain. Pre-Populated Domain Values include: 0 - Opt Out, 1 - Opt In.

CONSUMER ADDRESS CONSENT (442) This table allows for explicit consent to be given per address. An address in this context can be the postal mail address, a phone number or an email address. This  
25 granularity allows consumers to accept marketing promotions at specific email addresses, for example their yahoo or hotmail account, but not their

work address. A consumer can opt-out of phone marketing at home, but accept them by regular mail etc.

CONSUMER ADDRESS HISTORY (443) Keeps the history of changes in the consumer\_address table. A trigger may be used to keep this table up to date.

CONSUMER CATEGORY CONSENT (444) This level offers more granularity and conforms the most to P3P. P3P defines fifteen base categories. A domain table for the different categories called PRIVACY\_CATEGORY is provided to contain the base P3P categories as well as any additional custom category the business chooses to support. The consent table for this level is per party per category.

CONSUMER CATEGORY HISTORY (445) Keeps the history of changes in the consumer\_category\_consent table. A trigger may be provided to keep this table up to date.

CONSUMER LEVEL CONSENT (446) The privacy option that this PARTY has given his/her consent for the enterprise to make use of information. This level is used to track high level preferences per consumer. It can be used independent of category level preferences, or in an inheritance scheme in conjunction with the lower level tables. The privacy views should use the codes from this table in the absence of explicit consents at the category level. The more detailed preferences should always prevail and override the codes in this table.

CONSUMER LEVEL HISTORY (447) Keeps the history of changes in the consumer\_level\_history table. A trigger may be provided to keep this table up to date.



CONTACT INFO (448) A way to communicate with, or contact, PARTYs. It can be MAIL ADDRESS (P.O. Box, or street), ELECTRONIC ADDRESS, or TELEPHONE number.

CONTACT INFO TYPE (450) Indicates if an ADDRESS is MAIL,  
5 ELECTRONIC, or TELEPHONE.

CONTACT INFO USAGE (451) Specifies the usage of an address  
PARENTAL CONSENT (581) This table is added to support COPPA, which requires explicit parental consent for children under thirteen years of age. Any web site catering to children must offer an easy  
10 to understand privacy policy which requires children under thirteen years of age to get parental permission before the site can use or sell any personal information about them. If the site does not collect such information, then the policy will simply indicate that fact. However, if the site does collect such personal information COPPA requires the web site to  
15 offer the children's parents three types of consent options: Collection and Use Consent, Disclosure Consent and No Consent.

PARENTAL CONSENT HISTORY (582) Keeps the history of changes in the parental\_consent table. A trigger may be used to keep this table up to date.

20 PARTY (583) Any INDIVIDUAL, HOUSEHOLD, or ORGANIZATION of interest to the enterprise.

PARTY CONTACT INFO (585) Describes how a specific combination of ADDRESS and PARTY is used. For example: '123 Main Street' is used by 'Rachel' as 'Ship To'; '310-555-2342' is used by 'John' as  
25 'Fax number'.

POLICY DEFAULT (606) This table holds the business' privacy policy defaults. These default values can be used to automatically populate

the consumer related consent tables when the consumer accepts the default policy or in the absence of explicit consumer preferences.

POLICY DEFAULT HISTORY (607) Keeps the history of changes in the policy default. A trigger may be provided to keep this table up to  
5 date.

POLICY SCOPE (608) The scope of a privacy policy. POLICY SCOPE allows support for children and adult privacy default preferences. COPPA requires only three preference options: Collection and Use, Disclosure and None. Pre-Populated Domain Values include: Under 13,  
10 Over 13.

PRIVACY CATEGORY (610) This table holds the privacy category domain. The values are minimally the base P3P categories. They can be augmented by any business specific category such as employer. Pre-Populated Domain Values include: UniqueID, Purchase, Computer,  
15 Navigation, Content, State, Political, Health, Preference, Physical, Online, Financial, Interactive, Demographic, Other, Employer.

PRIVACY TYPE (611) This is a continuously expanding domain, as consumers become more aware of privacy. PRIVACY TYPE stores the different types of preferences that people can opt-in or opt-out of. Pre-  
20 Populated Domain Values include: Collection and Use, Third Party Disclosure, Affiliate Disclosure, Direct Marketing, Automated Decision, Sensitive Data, Merge PII with nonPII.

The PRIVACY Subject Area supports four levels of privacy  
25 granularity, which can be used independently or in a complimentary fashion. A business can choose to implement at a policy default level, the consumer level, consumer-category level and/or consumer-address-specific

level. Additional granularity to support business needs in specific vertical industries can be added.

### The Policy Default Level

5 At the highest level, the POLICY DEFAULT table 606 holds a business' privacy policy defaults. These default values can be used to automatically populate the consumer related consent tables when a consumer accepts the default policy or in the absence of explicit consumer preferences. The POLICY SCOPE table 608 is provided to support  
10 COPPA. The Under13 policy only applies to three privacy types: Collection and Use, Third Party Disclosure and Affiliate Disclosure.

### The Consumer Level

The consumer level is used to track high-level preferences per  
15 consumer. The consent table for this level is the CONSUMER LEVEL CONSENT table 446. The consumer level can be used independent of category level preferences, or in an inheritance scheme in conjunction with the lower level tables. The more detailed preferences should always prevail and override the codes in the CONSUMER LEVEL CONSENT  
20 table 446.

### The Consumer-Category Level

This level offers more granularity and conforms closely to P3P. P3P defines fifteen base categories. The PRIVACY CATEGORY domain table  
25 610 contains the base P3P categories as well as any additional custom category a business chooses to support. The consent table for this level is

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the CONSUMER CATEGORY CONSENT table 444 AND is per party per category.

### The Consumer-Address-Specific Level

5 This level allows for explicit consent to be given per address. An address in this context can be the postal mail address, a phone number or an email address. This granularity allows consumers to accept marketing promotions at specific email addresses, for example their yahoo or hotmail account, but not their work address. A consumer can opt-out of phone  
10 marketing at home, but accept them by regular mail etc. The consent table for this level is the CONSUMER ADDRESS CONSENT table 442.

### Parental Consent

15 This section is added to support COPPA, which requires explicit parental consent for children under 13. Any web site catering to children must offer an easy to understand privacy policy which requires children under 13 years of age to get parental permission before the site can use or sell any personal information about them. If a site does not collect such  
20 information, then the policy will simply indicate that. However, if a site does collect personal information then, COPPA requires the site owner to offer parents three types of consent options: Collection and Use Consent, Disclosure Consent and No Consent.

### History Support

25 In order to support history tracking requirements, each privacy level as well as the parental consent section includes a history table which carries exactly the same columns as the main table plus an effective date

and an end date. The history table is updated when consent codes are inserted, updated or deleted. The most current consent codes are contained in the main tables. The historical record population mechanics can be implemented via database triggers, which may be implemented as part of this LDM design. The history tables for the policy default level, the consumer level, consumer-category level, consumer-address-specific level and parental consent section are POLICY DEFAULT HISTORY table 606, CONSUMER LEVEL HISTORY table 447, CONSUMER CATEGORY HISTORY table 445, CONSUMER ADDRESS HISTORY table 443, and PARENTAL CONSENT HISTORY table 582, respectively.

### PROFILE

Figures 12A through 12G illustrate an entity-relationship diagram of the PROFILE subject area. The PROFILE subject area stores information concerning customer segments of interest to the enterprise. This information is typically purchased from a third party.

The entities of the PROFILE subject area are defined as follows:

AGE RANGE (418) Information regarding age ranges.

COMPUTER INFO (439) Profile data for entity.

COMPUTER TYPE (440) Stores computer hardware type information.

CONTACT METHOD (452) Describes contact preferences.

CONTACT PERIOD (453) Information regarding preferred contact periods.

EDUCATION LEVEL (480) Information regarding education levels.

EMPLOYMENT STATUS (483) Information regarding employment statuses.

ETHNICITY (485) Information regarding ethnicity.

GENDER (495) Information concerning gender.

INCOME RANGE (503) Information regarding income ranges.

INCOME TYPE (504) Describes types of income.

5 INTEREST MAP (510) Contains information linking web page URLs  
to interest.

LANGUAGE (544) List of language types.

LANGUAGE GROUP (545) List of language groups.

MARITAL STATUS (557) Contains information regarding marital

10 statuses.

OCCUPATION (566) Specifies occupations.

OCCUPATION GROUP (567) Specifies occupation groups.

OCCUPATION INDUSTRY (568) Specifies organizational  
industries.

15 PARTY PROFILE (590) Information linking party entities and  
profiles.

PARTY TRAIT PROFILE (593) Contains information linking party  
entities to their profiles, trait categories and traits with interest level  
scores.

20 PERSONAL INFO (603) Provides personal profile information.

PROFICIENCY (614) Standard Domain: Language Proficiency  
Level.

PROFILE INCOME (615) Income.

25 PROFILE INFO (616) Unique identifier for entity profile  
information.

PROFILE LANGUAGE GROUP (546) Information linking language,  
language group and language proficiency.

PROFILE SOURCE (617) Specifies the source of profile information.

PROFILE TRAIT (618) Describes specific interest within a demographic type.

5 REGENCY BAND (624) How long ago was the last purchase made.

REFERRAL BAND (626) How many people has this person referred

REVENUE BAND (631) Customer Domain to track the revenue generated by this customer.

10 SITE ACTIVITY INFO (641) Contains information regarding activities tracked during web visits.

TRAIT CATEGORY (654) Contains information concerning different types of profile information.

TRAIT GROUPING (655) Describes specific interest groupings within a demographic type.

15 TRANSACTION FREQUENCY BAND (663) Information regarding transaction frequency bands.

VISIT FREQUENCY RANGE (682) Information regarding browsers visit frequency.

20 YEARS AT RESIDENCE (703) Information regarding years at residence.

## PROMOTION

The PROMOTION subject area contains information concerning promotions, which are defined as marketing efforts, which are different from normal practice and designed for a specific purpose. Information is stored on the various components of the promotion, including the items and ads included, the type of ad, and the market segments targeted.

The entities of the PROMOTION subject area, illustrated in Figures 13A and 13B, are defined as follows:

CAMPAIGN (427) A marketing effort with a specific start and end date. Typically a large effort, that can consist of multiple PROMOTIONS.

- 5 The goal of a CAMPAIGN is usually to enhance the image of the enterprise, and/or drive more business and/or obtain more customers. Example: Sony launches a 3-month CAMPAIGN to build brand awareness, and creates several consumer oriented PROMOTIONS, TV ADs, etc. to support the CAMPAIGN.

- 10 CAMPAIGN\_X\_PROMOTION (428) Information regarding linkage between promotions and campaigns.

- COUPON CERTIFICATE (464) A specific instance of a COUPON that is trackable through a unique number. The intent is to provide targeted INDIVIDUALs with trackable COUPONS that enable the customer to be identified at redemption time, even if the redemption transaction is cash. A direct mail piece with a specific OFFER, containing a barcode with a unique code, or an individualized e-mail code.

COUPON STATE (465) Provided for BroadVision Support.

- 20 INCENTED SEGMENT (502) A mapping of a group of SEGMENTS to a specific OFFER. An OFFER can be made to more than one SEGMENT. For example, all customers whose purchases declined over 50% over the last 6 months are offered \$20 off their next order. This is a calculated table, the calculations occurring after data has been loaded into the warehouse. This could also be a Customer Domain table.

- 25 NETWORK (564) This entity represents a group of Publisher sites that an Ad or Campaign is run on. Ad Networks commonly have predefined Networks that Advertisers can choose to run their ads on.



Examples include a Computers & Technology Network that would include all of the Computer & Technology related sites the Ad Network has space on, or a Sports Network that includes all of the networks sports related sites.

5 OFFER (569) A specific incentive made available to customers. The OFFER entity usually contains 2 parts: a.) condition(s) to be met, and b.)the reward for a.). For example: Buy a Macintosh G4, and get a free Epson 700 printer.

OFFER TYPE (570) Customer Domain: Types of Offers.

10 PARTY COUPON (586) Information linking party entities; coupons and locations.

PROMOTION (619) A narrowly defined marketing effort designed for a specific purpose. Can be part of a larger CAMAPAGN. A PROMOTION has a specific start and end date. A PROMOTION can contain multiple OFFERS and ADs. For example: A PROMOTION can be created to drive DVD sales. It consists of two OFFERS: one for free shipping, and one for 10% off orders over \$100; and two2 ADs: a TV AD and a BANNER AD placed on selected websites.

20 SEGMENT (638) A cluster of PARTYS for marketing purposes. A SEGMENT can be re-used, and can receive multiple OFFERs. This is a calculated table, the calculations occurring after data has been loaded into the warehouse. This could also be a Customer Domain table.

### TIME

25 The TIME subject area contains information concerning the time in a given day by hours, minutes and seconds. The entities of the TIME subject area, illustrated in Figure 14, are defined as follows:

CLOCK TIME (437) This entity represents a specific instance time most likely represented in military time. Each row indicates a particular instance in time down to the second.

HOURS (497) This entity represents the hours of the time field.

5 MINUTES (558) This entity represents the minutes of the time field.

SECONDS (636) This entity represents the seconds of the time field.

TIME OF DAY (652) This entity represents a division of a day, i.e., morning, afternoon, night, etc. This may be defined in 4 or 6 hour periods or into however many segments the company wants to divide up a day.

10

### TRANSACTION ACTIVITY

Figures 15A thorough 15E illustrate an entity-relationship diagram of the TRANSACTION ACTIVITY subject area. The TRANSACTION ACTIVITY stores information concerning a customer's interaction with the company involving the sale or return of an item and the price and discounts associated with that item. It maps customers to entries in the Address Area, the item(s) of interest, and the associate dealing with the customer.

15

The entities of the TRANSACTION ACTIVITY subject area are defined as follows:

20

APPROVAL STATUS (419) The outcome of a request for approval of a non-cash transaction from a financial ORGANIZATION. Examples include: confirm identity of INDIVIDUAL only, deny purchase, etc.

DISCOUNT (475) The types of reasons why the total tender required for a given purchase may be reduced. May be based on the total SALES TRANSACTION, or can be ITEM specific. Reasons for reduction may include: loyalty card, summer sale, 2-for-1 sale, etc.

25



5       EXTERNAL COUPON (487) An external coupon redeemed during a  
SHIPPING TRANSACTION. EXTERNAL COUPONS include 3rd party  
coupons, such as manufacturer's or competitor's coupons.

10 external VENDOR, such as through drop shipment, etc.

FULFILLMENT LINE (493) The actual ITEMS contained in a FULFILLMENT.

15 Order On Time, Complete Order Late, Partial Order On Time, etc.

PARTY TRANSACTION (594) Contains information associating transactions to buyers and sellers.

20 PAYMENT LINES associated with it.

RETURN TRANSACTION LINE (630) Details PRODUCTs returned to a LOCATION by a customer for a refund or an exchange.

25 particular item. Charges may include: shipping, handling, insurance,  
overnight, etc.

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TRANSACTION ACTIVITY (657) A single CUSTOMER interaction or transaction involving the sale or return of one or more ITEMS.

TRANSACTION ADJUSTMENT (658) Contains information concerning transaction adjustments.

5 TRANSACTION CHARGE (659) Revenue obtained from customers that are not ITEM related, such as shipping & handling, insurance, etc.

TRANSACTION CONTACT INFO (660) Information linking transactions to physical locations.

TRANSACTION DISCOUNT (661) An amount that reduces the total  
10 TENDER amount required from the customer for a given purchase. This could be due to an OFFER, coupon, sale, markdown, damaged merchandise, etc. It can be related to an entire SHOPPING TRANSACTION, or more specifically related to ITEMS in a SHOPPING TRANSACTION LINE. Example: The amount of \$3.25 to be subtracted  
15 from total tender required due to the purchase of 750ml Kahlua by a loyalty card member.

TRANSACTION DISCOUNT LINE (662) A cross-reference mapping a SHOPPING TRANSACTION DISCOUNT to the actual ITEMS that was purchased to qualify for the DISCOUNT and/ or the ITEMS that  
20 received the DISCOUNT. Example: Cross-reference the full retail purchase of a 'six-pack of Coke a Cola' and the resultant 50% off 'Dodgers baseball cap' to the SALES DISCOUNT.

TRANSACTION LINE (664) The actual ITEMS purchased by a customer within a SALES TRANSACTION.

25 TRANSACTION LINE STATUS (665) This entity represents the status of a SHOPPING TRANSACTION LINE. It is used to determine

whether items are currently in a shopping basket, have been dropped from the basket, or have been purchased.

TRANSACTION RESPONSE (666) Captures responses based on customer transactions.

5 TRANSACTION RESPONSE TYPE (667) Defines the various types of customer transaction response types.

TRANSACTION STATUS (668) Denotes the current phase of a SHOPPING TRANSACTION, such as: canceled order, abandoned shopping cart, shopping cart that had been converted into an order, etc.

10 TRANSACTION TYPE (669) Differentiates a SHOPPING TRANSACTION. TRANSACTION TYPEs may include: Web Shopping Cart, Web Wish-list, Store Sale, Catalog Order, etc.

## VENDOR

15 The VENDOR subject area stores information about parties from which the company purchases goods and services. This includes information concerning purchase orders, returns, and items shipped directly to the company or drop shipped to a customer.

20 The entities of the VENDER subject area, illustrated in Figures 16A and 16B, are defined as follows:

VENDOR (672) An identifier of an ORGANIZATION that supplies ITEMS to a company. This ID is mapped to a party ID. This ID can represent an individual or a business.

25 VENDOR ITEM (673) Identifies which ITEMS can be obtained from which VENDORS.

VENDOR PURCHASE ORDER (674) Represents an order placed by the enterprise for ITEMSs to be supplied by a VENDOR.

VENDOR PURCHASE ORDER LINE (675) The detail line on the VENDOR PURCHASE ORDER that provides information about the ITEM being ordered.

5 VENDOR PURCHASE ORDER TYP (676) Distinguishes the various types of PURCHASE ORDERs.

VENDOR RECEIPT (677) A shipment of ordered goods from a VENDOR to the enterprise.

VENDOR RECEIPT ITEM (678) Information about a specific ITEM contained in a VENDOR RECEIPT.

10 VENDOR RETURN (679) ITEMs returned to the VENDOR, due to damage or malfunctioning of the ITEM.

VENDOR RETURN REASON (680) Establishes the reasons why an ITEM may be returned to a VENDOR. Reasons for return may include: damaged, incorrect item, etc.

## VISIT

15 The VISIT subject area stores information concerning a customer's history at a virtual store's web site. Included would be information about the ads that triggered the visit, the web pages browsed, and the items of  
20 interest to the consumer.

The entities of the VISIT subject area, illustrated in Figures 17A through 17F, are defined as follows:

BROWSER APPLICATION (422) This entity represents the internet browser application software family the client is running. For example:  
25 Internet Explorer, Netscape.

BROWSER APPLICATION VER (423) This entity represents the application and version of the internet browser that the client is using to view the web site. Examples include: Internet Explorer 5.0, Netscape 4.06.

5 CONVERSION (456) This table contains a record for the conversions that were recommendations from the recommendation engine. This table is provided to support integration with recommendation engines and does not imply TSEB functions as a recommendation engine.

10 CONVERSION CATEGORY (457) Contains information concerning the linkage between recommended items and the web page the item was displayed on.

DOMAIN EXTENSION (479) This entity represents the extension of the name of the domain server. For example: .com, .net, .org.

15 EMAIL CLIENT APPLICATION (482) This entity represents the email application used by a client to read and send email, such as Microsoft Outlook Express 5.0.

ENTRY FLAG (484) Describes the order of the pages viewed during a web visit, such as first page, exit page, intermediate page.

20 EXIT METHOD (486) This entity represents the method by which the user left a web site. This would have the value 'timeout' for most visits, but other values could be defined for explicit actions that result in a user exiting the site.

FILE (488) The entity represents an electronic file, for example song .mp3 file, a document .pdf file, etc.

25 FILE DOWNLOAD (489) The entity represents the request from a user to download a file from a web site.

FILE TYPE (490) The entity represents the types by which a FILE may be classified. Common file types include EXE, MP3, PDF, etc.

HTML RESPONSE FILE (500) This entity represents the actual HTML file that is returned to the user as a result of a click.

INTERACTION (506) This entity represents activities that occur during a visit that can not be directly tied to a CLICK or set of CLICKs during a VISIT.

INTERACTION RESULT (507) Information regarding interaction results.

INTERACTION SUBTYPE (508) Information regarding interaction sub types.

INTERACTION TYPE (509) Describes the various types of interactions users can have with an enterprise.

IP ADDRESS (513) This entity represents the Internet Protocol address the client requests are coming from.

PAGEVIEW (578) Loaded from weblog unless a customer has a database with this information such as Broadvision.

PAGEVIEW\_COMPONENT (579) This table lists all the components downloaded by this PageView.

PAGEVIEW\_X\_INTERACTION TASK (580) This table is the output of an application that can examine the interactions associated with each click and determine their outcome, e.g., purchase, abandonment etc.

PLATFORM (604) This entity represents the operating system platform family that the client is running. Examples: Windows 9x, Windows NT, Mac, UNIX.

PLATFORM VER (605) This entity represents the operating system platform and version the client is using. Examples: Windows 98, Windows NT 4.0.

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QUERY STRING FIELD NAME (621) This entity represents the domain of parameter names that may appear in the query string of a URL for a WEB PAGE.

5 QUERY STRING FIELD VALUE (622) This entity represents the domain of parameter values that may appear in the query string of a URL for a WEB PAGE.

10 QUERY STRING NAME VALUE (623) This entity stores the relationship between PageViews, QUERY STRING FIELD NAMES and QUERY STRING FIELD VALUES. It holds the set of name-value pairs from the query string of the URL that is associated with this PageView. The name-value pairs often include elements such as search parameters.

15 RECOMMENDATION (625) This table contains a record for each recommendation that was made by the recommendation engine. This table is provided to support integration with recommendation engines and does not imply TSEB functions as a recommendation engine.

REFERRAL TYPE (627) An entity used for classifying referrals into various sub-types such as email referrals, e-location referrals, etc.

UNIQUE VISIT (670) If a cookie does not exist in partyID then the visit is unique. If unique , then cookie\_value is inserted in party.partyID.

20 VISIT (681) A period of time that a PERSON spends at a LOCATION.

VISIT LOCATION (683) Contains information linking visits to locations.

25 VISITOR DOMAIN (684) This entity stores information about IP addresses from which customers access a retailer's web site. This is useful in providing summary level information about various access points for customers such as internet service providers, public access terminals,

companies, universities, government sites, etc. The information can be useful in selecting advertisements and designing promotions.

WEB IDENTIFICATION METHOD (685) This entity represents the method by which the PARTY was identified for a WEB VISIT.

5 WEB VISIT (697) Loaded from weblog unless customer has a database with this information such as Broadvisision.

WEB VISIT TYPE (698) This entity represents a classification of the result derived from a WEB VISIT. Possible values include: Browse, 1st Purchase, Repeat Purchase, etc.

10 WEB\_VISIT\_FILE (699) This associative table stores all the files downloaded during a visit.

## VISITOR

15 Figures 18A through 18E illustrate an entity-relationship diagram of the VISITOR subject area. The VISITOR subject area captures information about the users involved in web transactions and/or interactions. This area maintains information about customer's payment accounts, and household and organizational affiliations, and it maps customers to entries in the Address and Demographics Subject Areas.

20 The entities of the VISITOR subject area are defined as follows:  
ACCOUNT STATUS (401) Information regarding account statuses.  
ACTIVITY STATUS (402) This entity stores the valid states of an entity. Valid states can be active, inactive, or deleted.

25 BRAND OWNER ORG (421) The ORGANIZATION that created, owns, and controls a specific BRAND. For example: Nabisco, Victoria's Secret, Pepsi Co., etc.

5

CREDIT INFO (469) Information regarding party entities credit histories.

10

**CUSTOMER SCORE (471)** This entity represents the score a customer is given based on their previous behavior, and represents their likelihood to perform some other action.

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**INDIVIDUAL (505)** Any human being of interest to the enterprise.

LOYALTY LEVEL (555) Loyalty program information.

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ORGANIZATION TYPE (575) Information regarding organization types.

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PARTY (583) Any INDIVIDUAL, HOUSEHOLD, or ORGANIZATION of interest to the enterprise.

PARTY ACCOUNT (584) Information regarding accounts.

PARTY LOYALTY LEVEL (704) Loyalty program information.

5 PARTY PAYMENT ACCOUNT (589) Information linking party entities to payment accounts.

PARTY SEGMENT (591) A cross-reference of the actual PARTYs contained in a specific SEGMENT.

10 PARTY STATUS (592) This entity maintains the relationship between a PARTY and a PARTY STATUS to allow tracking of the history as the PARTY STATUS of a PARTY changes.

PARTY TYPE (595) Contains information regarding party entity types.

15 PAYMENT ACCOUNT (596) An account established by a PARTY with an ORGANIZATION, typically to facilitate and enable the transfer of funds.

20 PAYMENT ACCOUNT STATUS (597) This entity maintains the relationship between a PAYMENT ACCOUNT and an ACTIVITY STATE to allow tracking of the history as the ACTIVITY STATE of a PAYMENT ACCOUNT changes.

PAYMENT ACCOUNT TYPE (598) Describes a kind of PAYMENT ACCOUNT, for example: Check, Credit Card, Loyalty Card, etc.

PAYMENT TRANSFER (599) This table contains account number information for both source and destination accounts.

25 PAYMENT RECORD (601) This table contains records detailing the transfer of funds between two businesses.

PERSONA (602) The 'role' an INDIVIDUAL is playing while interacting with the enterprise, typically in association with an ORGANIZATION. For example, INDIVIDUAL Jill may posses two different PERSONAs: Jill may order ITEMS in her capacity as 'owner' of 'Jill's Dog Grooming Co.', or Jill may call about a problem with an order in her capacity as a 'buyer' for ABC Corporation.

SCORE TYPE (634) Describes the type of technology used to generate the score, e.g., CART, Decision Tree, CHAD etc.

SIC (640) Standard Industry Classification Codes. A way to indicate the type of business an ORGANIZATION is. Used for segmentation purposes by the marketing industry.

SUPPRESSION (649) CRM support table linking suppression information to party entities.

VENDOR (672) An identifier of an ORGANIZATION that supplies ITEMS to a company. This ID is mapped to a party ID. This ID can represent an individual or a business.

## WEB SERVER

The WEB SERVER subject area provides summary information, operational metrics and errors about the physical server devices servicing a given web visit by a customer.

The entities of the WEB SERVER subject area, illustrated in Figure 19, are defined as follows:

WEB SERVER (689) Provides summary information about the physical server devices servicing a WEB VISIT.

WEB SERVER ACTIVITY (690) Provides WEB SERVER operational metrics.

WEB SERVER SOFTWARE (691) Captures information about the software being utilized by the web server.

WEB SERVER STATUS (692) An entity used to provide information about WEB SERVER errors.

5 WEB STATUS CATEGORY (695) Domain for Web Server error categories such as: Unknown, Informational, Successful, Redirection, Client Error.

### WEB SITE

10 The WEB SITE subject area stores information about the company's web sites including page components, page generation, and web page type.

The entities of the WEB SITE subject area are, illustrated in Figures 20A and 20B, are defined as follows:

15 CONTEXT (454) Contains the business intent represented by web pages.

CRAWLER (466) This table contains a list of crawler sites that have visited the web site of the business entity.

INTERNAL FLAG (511) Usage of this table is customer specific.

20 NETWORK X PUBLISHER (565) A cross-reference of the actual PUBLISHERs contained in a specific NETWORK.

PAGE GENERATION TYPE (577) This entity is used to classify the method involved in generating a web page. For example: static versus dynamic page.

25 PARTY LOGIN (588) This entity represents the login information of a PARTY. This entity supports tracking of a PARTY's login names for multiple web sites.

SECTION TYPE (637) This entity represents a classification of the content for a WEB SITE SECTION similar to sections of a newspaper. A WEB SITE may be divided into several sections based on the content of the pages. For example, one section may be sports related content while  
 5 another may be finance related.

SITE CONTENT TYPE (642) This entity represents a classification of the content of a WEB SITE. Possible SITE CONTENT TYPEs include Sports, News, Portal, etc.

SITE LOCALE (643) This entity represents the nationality or locale  
 10 the a WEB SITE is designed for, e.g., Yahoo Germany or Yahoo Spain.

WEB PAGE (686) Source: Weblog ->URL\_Stem Frame presented after a click . It will be identified as any URL in the click records which does not have a component suffix with a web\_page\_flag to be set in weblog. URLs in weblog->referrer\_origin are recorded here also, as they  
 15 are referenced in the click table.

WEB PAGE CONTEXT (687) Links the context for which the web page is being rendered.

WEB PAGE REGION (688) This entity represents areas in which a WEB PAGE may be divided. Examples include: TOP, BOTTOM, TOP-  
 20 LEFT.

WEB SITE (693) This entity represents a collection of WEB PAGES under a single domain name.

WEB SITE SECTION (694) This entity represents divisions of a WEB SITE, such as Yahoo Sports or Yahoo Finance, in order to divide  
 25 large WEB SITES into smaller divisions of related WEB PAGES that contain similar content.

**Conclusion**

The Figures and description of the invention provided above, reveal a flexible relational data model for E-Business businesses. The E-Business Logical Data Model (E-LDM) design includes an extensible data model that supports current privacy laws and conventions and which can be readily applied anywhere an E-Business retailer conducts business.

This design supports four levels of privacy granularity, which can be used independently or in a complementary fashion. An E-Business retailer can choose to implement at a policy default level, the consumer level, consumer category level and/or consumer-address-specific level.

Additional granularity to support business needs in specific vertical industries can be added. All fifteen of the basic P3P privacy categories are implemented in this design.

The foregoing description of the preferred embodiment of the invention has been presented for the purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed. Many modifications and variations are possible in light of the above teaching. It is intended that the scope of the invention be limited not by this detailed description, but rather by the claims appended hereto.